

What is claimed:

1. A method of treating in an animal that has suffered damage to cerebrospinal tissue or that has an indication creating a risk of damage to cerebrospinal tissue, the method comprising:
 - 5 a. injecting a physiologically acceptable cerebrospinal perfusion fluid into a first catheter into the cerebrospinal pathway, which cerebrospinal perfusion fluid has a neuroprotecting effective amount of a neuroprotectant;
 - b. withdrawing fluid at a second catheter into the cerebrospinal pathway to create a flow and flow pathway between the first and second catheters;
 - 10 and
 - c. maintaining the flow for a period of time adapted to perfuse an affected tissue.
2. The method of claim 1, wherein the method is adapted to perfuse at least 1 CSF volume.
- 15 3. The method of claim 1, wherein the method is conducted in humans and the perfusion volume is 300 mL to 3,600 mL/hr.
4. The method of claim 1, wherein the flow is maintained for between 6
20 hours and 120 hours.
5. The method of claim 1, wherein the withdrawn fluid for a first 3 CSF volumes is not recirculated by injection at the first catheter.
- 25 6. The method of claim 1, further comprising:
 - d. administering to the animal at least daily over the course of at least seven days a neuroprotecting effective amount of a neuroprotectant, with the majority of administrations conducted by a route of administration that does not use the catheters or which creates a flow that perfuses no more than 5
30 volumes of fluid resident in the cerebrospinal pathway.
7. The method of claim 1, wherein the damage to cerebrospinal tissue is caused by stroke, a neurodegenerative disease or trauma.

8. A method of treating in an animal that has suffered damage to cerebrospinal tissue or that has an indication creating a risk of damage to cerebrospinal tissue comprising:

- 5 a. injecting a cerebrospinal perfusion fluid into a first catheter into the cerebrospinal pathway, which fluid has a neuroprotective effective amount of a neuroprotectant, wherein the cerebrospinal perfusion fluid further comprises one or both of:
 - 10 1. an emulsion-forming effective amount of a lipid composition comprised of lipids found in biological membranes, or
 2. 0.05 – 2.0 g/dL albumin;
- b. withdrawing fluid at a second catheter into the cerebrospinal pathway to create a flow and flow pathway between the first and second catheters; and
- 15 c. maintaining the flow for a period of time adapted to perfuse an affected tissue.
9. The method of claim 8, wherein the flow is maintained for 6 to 120 hours.
10. The method of claim 8, further comprising:
 - 20 d. administering to the animal at least daily over the course of at least seven days a neuroprotecting effective amount of a neuroprotectant agent, with the majority of administrations conducted by a route of administration that does not use the catheters or which creates a flow which perfusions no more than 5 volumes of fluid resident in the cerebrospinal pathway.
- 25 11. The method of claim 8, wherein the lipids are phospholipids.
12. The method of claim 8, wherein fluid is adapted to not carry a respiration-supporting amount of oxygen.
- 30 13. A method of treating a neurodegenerative disease comprising:

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- a. injecting a physiologically acceptable cerebrospinal perfusion fluid into a first catheter into the cerebrospinal pathway, which fluid has a neuroprotective effective amount of a neuroprotectant;
 - b. withdrawing fluid at a second catheter into the cerebrospinal pathway to create a flow and flow pathway between the first and second catheters; and
 - c. maintaining the flow for a period of time adapted to perfuse an affected tissue.

10 14. The method of claim 13, wherein the disease is Alzheimer's or multiple sclerosis.

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15. A method of treating stroke or trauma to cerebrospinal tissue comprising:
- a. injecting a physiologically acceptable cerebrospinal perfusion fluid into a first catheter into the cerebrospinal pathway, which fluid has a neuroprotective effective amount of a neuroprotectant;
 - b. withdrawing fluid at a second catheter into the cerebrospinal pathway to create a flow and flow pathway between the first and second catheters; and
 - c. maintaining the flow for a period of time adapted to perfuse an affected tissue.

20 16. A method of treating in an animal that has suffered damage to cerebrospinal tissue or that has an indication creating a risk of damage to cerebrospinal tissue comprising:

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- a. injecting a cerebrospinal perfusion fluid into a first catheter into the cerebrospinal pathway, which fluid has a neuroprotective effective amount of a neuroprotectant, wherein the neuroprotectant is (R,S)-alpha-methyl-4-carboxyphenylglycine, (S)-2-amino-4-phosphonobutyrate, (2S, 3S, 4S)-alpha-carboxypropyl-glycine, (1S, 3R)-1-aminocyclopentane-1,3-dicarboxylic acid, nimodipine, nicardipine, ziconotide, dizocilpine,
 - 30 eliprodil, cerestat, D(-)-amino-5-phosphonopentanoic acid, selfotel, (±)-6-(1(2)H-tetrazol-5-yl)methyldecahydroisoquinoline-3-carboxylic acid, cis-(±)-4-[(2H-tetrazol-5-yl)methyl]piperidine-2-carboxylic acid, memantine,

- remacemide, dexamabinol, sinnabidiol, [2,3-dioxo-7-(1H-imidazol-1-yl)6-nitro-1,2,3,4-tetrahydro-1-quinoxaliny]acetic acid monohydrate, 7-chloro-3-methyl-3,4-dihydro-2H-1,2, 4-benzothiadiazine S,S-dioxide, GV150525A, 1-aminocyclopropanecarboxylic acid, ACPCM, ACPCE, 5 R(+)-3-amino-1-hydroxypyrrolid-2-one, R-*cis*- β -methyl-3-amino-1-hydroxypyrrolid-2-one, ifenprodil, NPS-1506, 1,2-dihydrophthalazine, licositnel, clomthiazole, MDL-27192, ceresine, ascorbic acid, nitroarginine, lubeluzole, steroidal antiinflammatories, non-steroidal antiinflammatories, alpha-phenyl-n-t-butyl-nitrone, AEOL 10150 or 10 10113 metalloporphirin, L,L isomer of Z-Leu-aminobutyric acid-CONH(CH₂)₂, AK295, Z-Leu-aminobutyric acid-CONH(CH₂)₃-morpholine, N-benzyloxycarbonyl-Val-Phe, z-VAD-CHO, z-DEVD, citicoline, TAK-147, etanercept, LY-287041, atropine or pralidoxime;
- 15 **b.** withdrawing fluid at a second catheter into the cerebrospinal pathway to create a flow and flow pathway between the first and second catheters; and
- c.** maintaining the flow for a period of time adapted to perfuse an affected tissue.